IN THE CLAIMS:

1-16. (Cancel)

17. (New) Method for controlling the pressure in at least one inflatable cuff of a blood pressure measuring apparatus with a plethysmographic sensor device, whereby a plethysmographic signal PG and a cuff pressure signal BP are obtained, comprising the following steps:

a) in a first, inner control loop the cuff pressure signal BP is used as control variable and is fed into a difference amplifier as a first input signal,

b) in a second, outer control loop the plethysmographic signal PG, with its mean value $\overline{PG}$ suppressed, is fed into a controller and is added to a set-point signal SP, and a target signal SW is generated, which is fed into said difference amplifier as a second input signal, and

c) the output signal AS of the difference amplifier is used to control at least one valve connected to a pressure source, which in turn regulates the pressure in the cuff.

18. (New) Method according to claim 17, wherein the mean value $\overline{PG}$ of the plethysmographic signal PG is determined in a third control loop and continuously corrected as input signal of the second control loop.

19. (New) Method according to claim 17, wherein the amplification parameters P, I and/or D are optimized in a fourth control loop by means

of the plethysmographic signal PG and the cuff pressure signal BP, and are continuously corrected as inputs to the controller.

20. (New) Method according to claim 17, wherein in a fifth control loop the set-point signal SP is readjusted, depending on the integral of the plethysmographic signal PG.

21. (New) Method according to claim 17, wherein in a sixth control loop the set-point signal SP is readjusted on the basis of derived quantities, such as amplitude, mean value or wave form of the plethysmographic signal PG and the cuff pressure signal BP, using a fuzzy-logic-approach.

22. (New) Method according to claim 17, wherein in a seventh control loop the set-point signal SP is readjusted in dependence of the pulse waveform of the cuff pressure signal BP.

23. (New) Method according to claim 17, wherein in an eighth control loop the set-point signal SP is readjusted by means of neural networks, auto-regressive models or self-learning models.

24. (New) Method according to claim 17, wherein the cuff pressure signal BP is fed to a systole/diastole detector whose output signal is used as control variable in at least one of control loops three to eight.

25. (New) A device for controlling the pressure in at least one inflatable cuff of a blood pressure measuring apparatus, comprising a plethysmographic sensor device for obtaining a plethysmographic signal PG and a

pressure sensor for obtaining a cuff pressure signal BP, wherein two control loops acting on a difference amplifier are provided, where the first, inner control loop uses the cuff pressure signal BP as a first control variable and where the second, outer control loop is provided with a controller which generates a target variable SW from the plethysmographic signal PG as a second control variable, and where the output of the difference amplifier controls at least one valve connected to a pressure source, thereby regulating the pressure in the cuff.

26. (New) Device according to claim 25, wherein the second control loop is provided with a difference amplifier which subtracts the plethysmographic signal PG from its mean value $\overline{PG}$, and with a summation unit adding a set-point signal SP.

27. (New) Device according to claim 26, wherein a device is provided for computing an initial value for the mean value of the plethysmographic signal.

28. (New) Device according to claim 26, wherein a device is provided for computing an initial value for the set-point signal SP.

29. (New) Device according to claim 25, wherein said difference amplifier controls an inlet valve connected to a pressure source via a non-inverting amplifier unit and an outlet valve via an inverting amplifier unit, said valves being pressure-connected to the inflatable cuff.

30. (New) Device according to claim 25, wherein said valves being pressure-connected to the inflatable cuff are designed as proportional valves.

31. (New) Device according to claim 25, wherein said difference amplifier is designed as a comparator which actuates at least one digital switching valve for pressure regulation in the cuff.

32. (New) Device according to claim 25, wherein the plethysmographic sensor is furnished with a device for the elimination of stray light or ambient light from the plethysmographic signal PG.

33. (New) Device according to claim 25, wherein the light source of the plethysmographic sensor is furnished with circuitry for controlling its voltage or current.

34. (New) Device according to claim 25, wherein said at least one inflatable cuff is a finger cuff.

35. (New) Device according to claim 25, wherein said controller is a PID-controller.